

Annual Report for the period July 2008-July 2009

Operation of SCINDA Receiver at the University of Calcutta

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The SCINDA receiver has been operational at the Institute of Radio Physics and Electronics, University of Calcutta, Calcutta, India since November 2006. A proposal for procuring a dedicated broadband internet connection for uploading the SCINDA data and its archival, and on-line power backup was submitted to the Asian Office of Aerospace Research and Development (AOARD), Japan in May 2008. A one-time grant of US\$6900.00 was received in July 2008. During the period July 2008 through July 2009, operation of the SCINDA receiver has been almost uninterrupted except during the total solar eclipse of July 22, 2009. A dedicated broadband internet connection is operational from the government-run Bharat Sanchar Nigam Limited (BSNL) since October 2008. An on-line UPS has been procured to prevent data loss due to disruption of power.

Data from the SCINDA receiver is available to the Satellite Beacon Group of this Institute in the post-processed form. It has been utilized for studying some Space Weather events occurring on February 2, 2008 and September 25, 2008 when post-sunset scintillations were observed on GPS links from Calcutta (22.58°N, 88.38°E geographic; magnetic dip: 32°N). The SCINDA GPS S4 and elevation angle plot of September 25, 2008 showed fluctuations on the SV12 link around 21:30 LT. Figure 1 shows the GPS S4 and elevation angle plot corresponding to September 25, 2008. The shaded portion of the figure corresponds to the local post sunset hours. The SCINDA polar plot for the same evening showed the location of SV12 to be almost due south of Calcutta as evident from Figure 2. A software-based dual frequency high resolution GPS receiver is available with this group which has the capability of measuring TEC

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14. ABSTRACT The SCINDA receiver has been operational at the Institute of Radio Physics and Electronics, University of Calcutta, Calcutta, India since November 2006. During the period July 2008 through July 2009, operation of the SCINDA receiver has been almost uninterrupted except during the total solar eclipse of July 22, 2009. A dedicated broadband internet connection is operational from the government-run Bharat Sanchar Nigam Limited (BSNL) since October 2008. An on-line UPS has been procured to prevent data loss due to disruption of power. Data from the SCINDA receiver is available to the Satellite Beacon Group of this Institute in the post-processed form. It has been utilized for studying some Space Weather events occurring on February 2, 2008 and September 25, 2008 when post-sunset scintillations were observed on GPS links from Calcutta (22.58°N, 88.38°E geographic; magnetic dip: 32°N). The SCINDA GPS S4 and elevation angle plot of September 25, 2008 showed fluctuations on the SV12 link around 21:30 LT. The period of this report correspond to very low sunspot number resulting in very few severe Space Weather events as observed on February 02, 2008 and September 25, 2008. Although the current solar cycle has been weak so far, it may take only one powerful Space Weather event to cause serious damage to the technological infrastructure on which society relies. This SCINDA station in Kolkata India is operational continuously throughout the year supplying data to the network of such stations.					
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with an accuracy of 5×10^{-4} TEC unit and provides phase of the received signals at both L1 and L2 frequencies.

Figure 3 shows the variation of CNO (C/N ratio) at L1 and TEC during the evening hours of September 25, 2008 on the SV12 link from Calcutta using data from the software based GPS receiver. A patch of scintillation could be observed around 21:30 LT coupled with bite out in TEC. The phase deviation at L1 and its moving average corresponding to September 25, 2008 for the GPS SV12 link from Calcutta is shown in Figure 4. A patch of phase scintillation may be observed around 21:36 LT with increased deviation around that time.

The period of this report correspond to very low sunspot number resulting in very few severe Space Weather events as observed on February 02, 2008 and September 25, 2008. Although the current solar cycle has been weak so far, it may take only one powerful Space Weather event to cause serious damage to the technological infrastructure on which society relies.

The expenditure incurred so far during the period July 2008 through July 2009 has been INR 198523.00 with a balance of INR 96678.00. In order to sustain the continuous recording and uploading of the SCINDA data, rental for the broadband internet connection has to be continued, storage media for archiving the data and batteries for the online UPS procured and other contingent expenses met. It is hereby proposed to utilize the balance amount of INR 96678.00 during the next one year period for the above purpose.

GPS S₄ & Elevation Angle – Calcutta Evening of 25 Sep 2008 (Day 269)

Last Updated: 25 Sep 23:56Z

300km Sunset over Calcutta : 13:10Z (19:04 Local) 300km Sunrise: 00:00Z (05:54 Local)

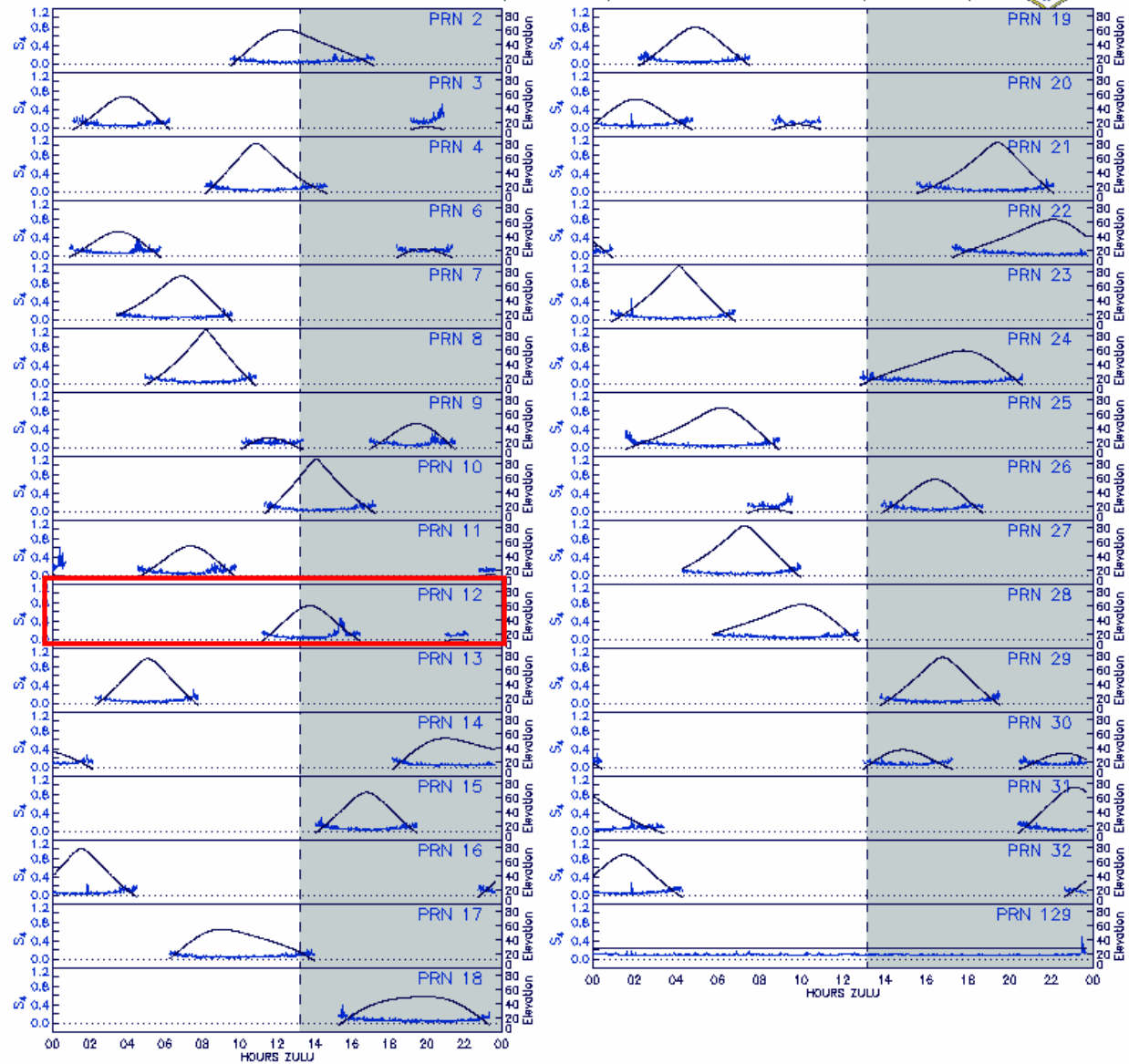


Figure 1

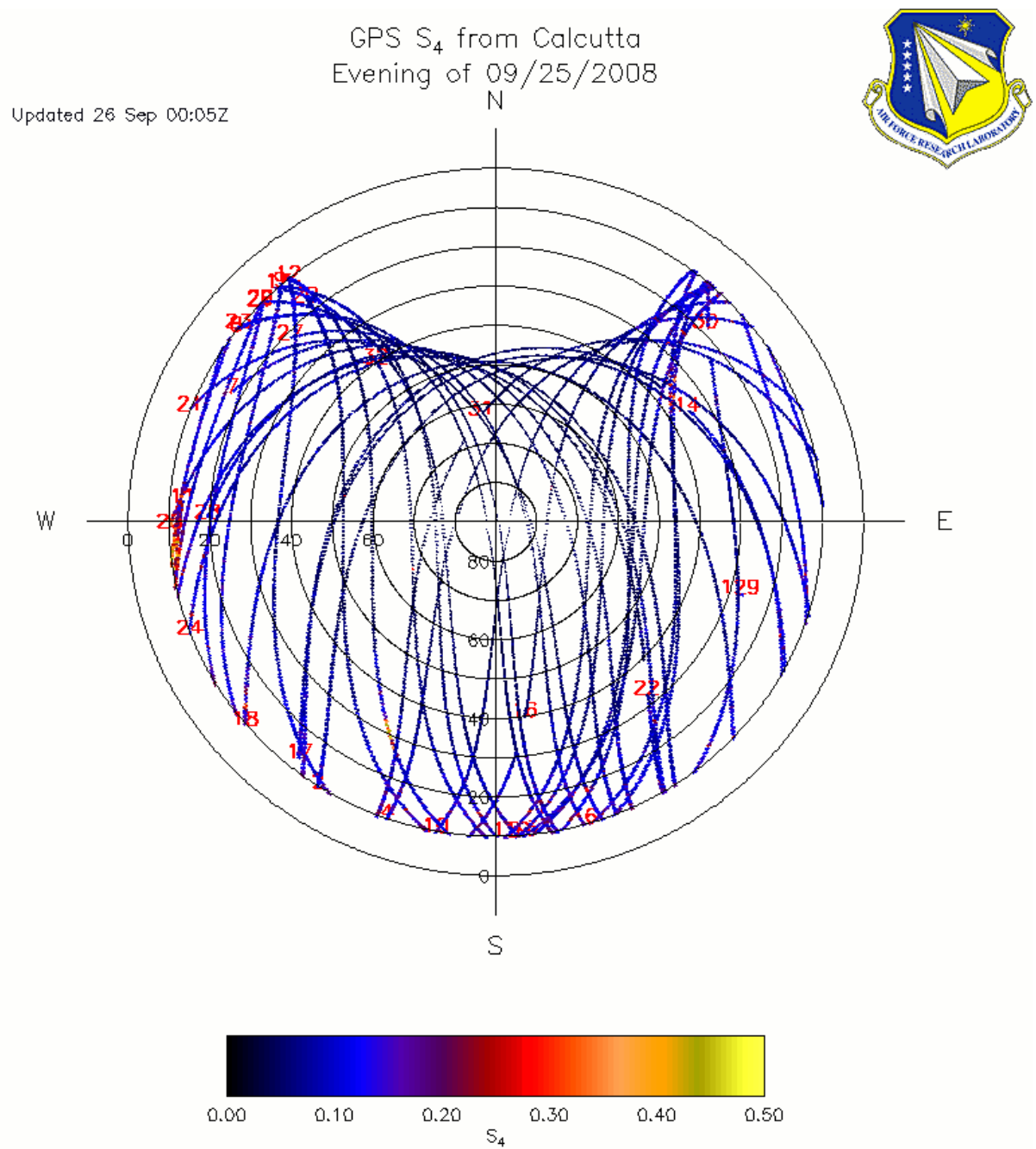


Figure 2

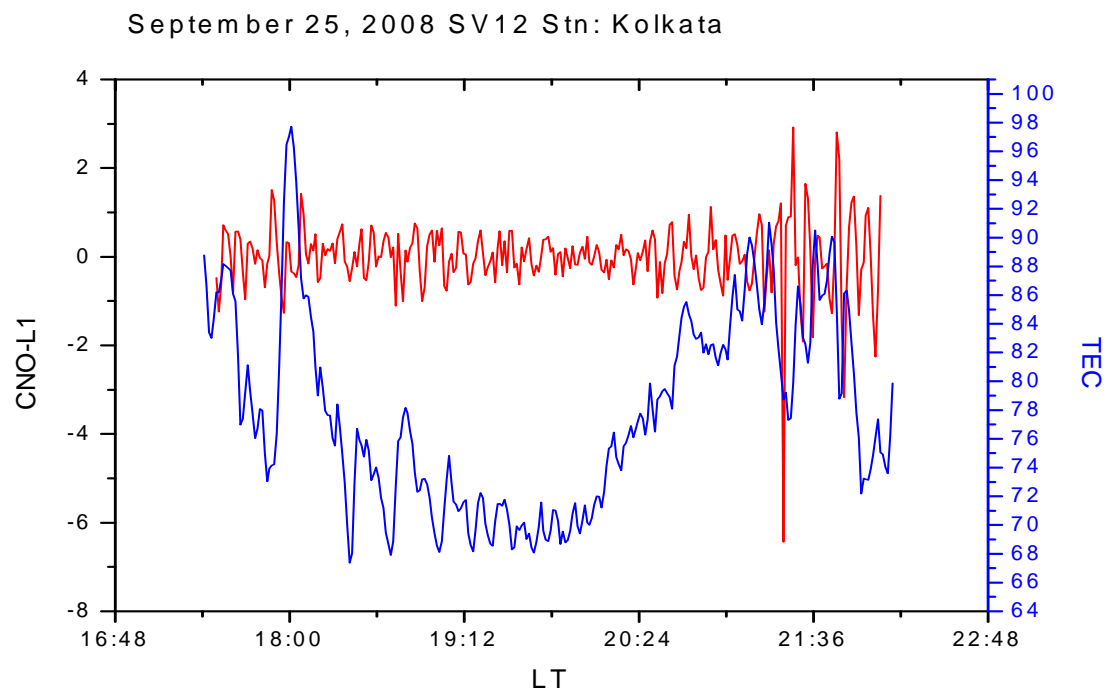
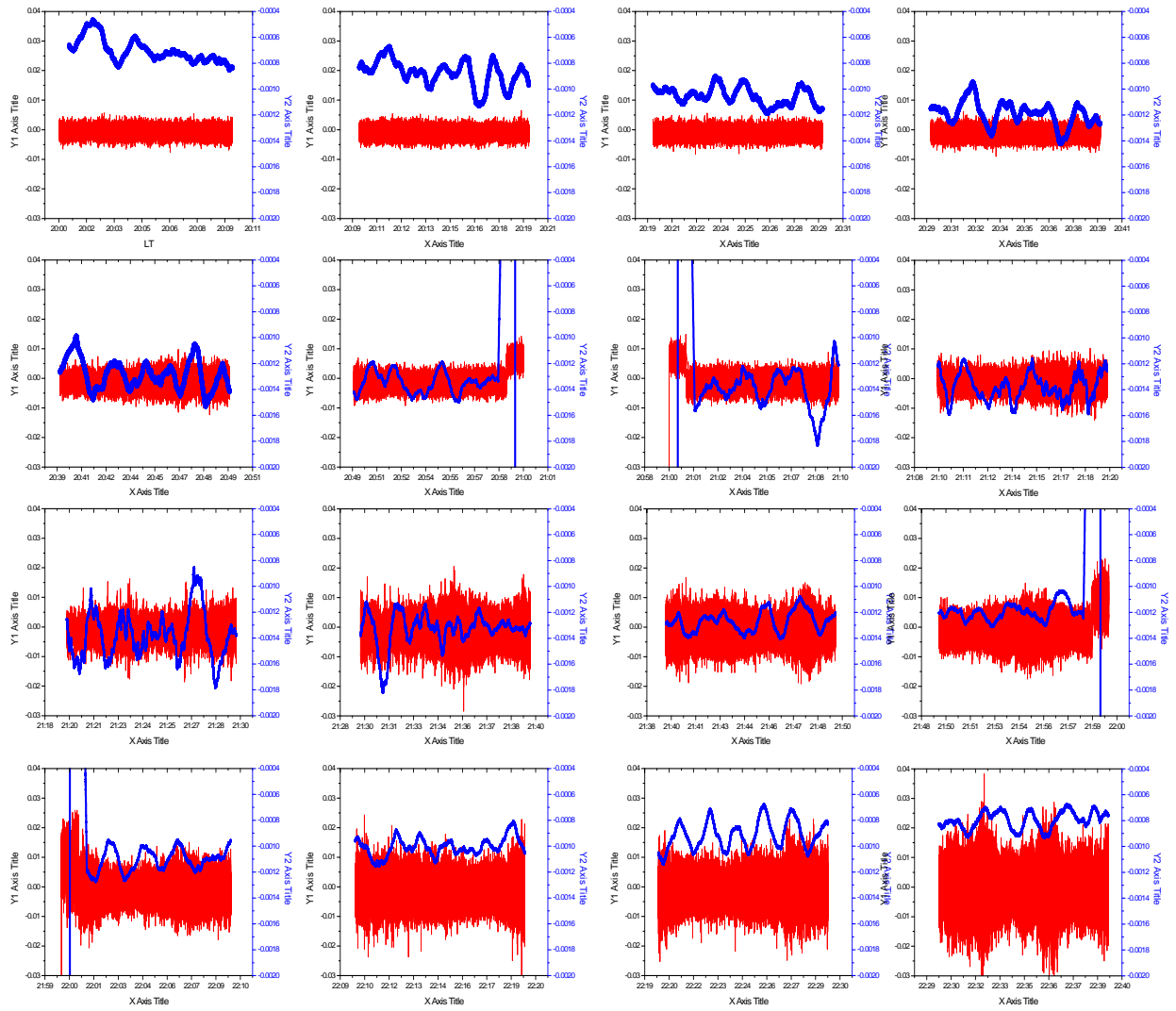


Figure 3



September 25, 2008 Stn: Kolkata SV12

Figure 4

Expenditure Incurred during the period July 2008-July 2009 for the project “SCINDA”

Sl.No.	Head	Sanctioned Amount (\$)	Sanctioned Amount in (Rs.)	Expenditure (Rs.)	Balance (Rs.)
1	Application fees, Laying of Cables for dedicated Broadband Connection	1000.00		1,000.00	
2	Rental for Broadband Connection	1500.00		23,265.00	
3	On line UPS with Power Supply	2500.00		91,313.00	
4	Storage Media for archiving the data	1000.00		44,245.00	
5	Over head 15%	900.00		38,700.00	
		6,900.00	2,95,201.00	1,98,523.00	96,678.00